STATE OF ILLINOIS

ILLINOIS COMMERCE COMMISSION

COMMONWEALTH EDISON COMPANY	:	
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Application of COMMONWEALTH EDISON COMPANY, for a Certificate of Public Convenience and Necessity, Pursuant to Section 8-406 of the Illinois Public Utilities Act, to construct, operate and maintain a new transmission substation, in Will County, Illinois	:	No. 02-0523

Direct Testimony of

THOMAS E. WIEDMAN

Director of Transmission Planning
Commonwealth Edison Company

ComEd Ex. 1

Q. Please state your name and business address.

A. Thomas E. Wiedman. My business address is Commonwealth Edison Company, Two Lincoln Centre, Oakbrook Terrace, Illinois 60181-4260.

Q. By whom are you employed and in what position are you employed?

A. I am employed by Commonwealth Edison Company ("ComEd") as its Director of Transmission Planning.

Q. When did you assume this position?

A. I began serving in my present position in October, 2000.

Q. How long have you been employed by ComEd?

A. I have been employed by ComEd for 32 years.

Q. Please describe your responsibilities as ComEd's Director of Transmission Planning.

A. As ComEd's Director of Transmission Planning, I am responsible for determining where and when we need to reinforce ComEd's transmission system. I direct the development of plans and criteria for transmission reinforcement including the coordination of transmission planning at the regional level.

Q. Please briefly describe the prior positions you have held at ComEd.

A. Prior to assuming my present position as ComEd's Director of Transmission Planning, I served as ComEd's Director of Bulk System Security. In that position, I was responsible for the daily operations of the interconnected ComEd transmission system, including its security. I was previously Director of System Protection and Control, System Protection

Engineer, Transmission Planning Section Engineer, Relay Planning Section Engineer, and other positions in planning, system protection planning and design, and field-testing.

Q. Please describe your educational background.

A. I have a Bachelor of Science degree in Electrical Engineering from the University of Illinois at Chicago, which I received in 1970. I hold a Master of Business Administration from Loyola University, which I received in 1974. I also hold a Master of Science in Electrical Engineering from the Illinois Institute of Technology, which I received in 1993.

Q. Have you served as a member of any professional organizations, committees, or task forces relating to electric utility system planning and engineering?

A. Yes. I am a registered professional engineer in the State of Illinois. I am a Senior Member of the IEEE Power Engineering Society and past member of the IEEE Power System Relaying Committee.

Q. Are you familiar with the planning and design of electrical transmission systems, and ComEd's bulk power system in particular?

A. Yes. Except for the period during which I was Director of Bulk System Security, which dealt with operation of the bulk power system, my entire career has been devoted to the planning, design, and protection of the ComEd system.

Q. Are you familiar with the Petition filed by ComEd in this proceeding?

A. Yes, I am.

Q. What is the purpose of the Petition?

A. The purpose of the Petition is to apply for a Certificate of Public Convenience and Necessity to construct, operate and maintain a new transmission substation tied to the adjacent transmission system.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to explain why the proposed substation is needed.

Q. Please explain how ComEd's transmission and distribution system delivers electricity to customers.

A. ComEd receives electricity from a variety of sources, including base load nuclear and fossil fuel generating stations and peaking units. The purpose of the transmission and distribution system is to reliably deliver this power to customers, at the voltage and quantity required.

A network of 765 kV, 345 kV and 138 kV transmission lines form the backbone of ComEd's system. These transmission lines move "bulk" power from the various sources of supply to the areas of ComEd's service territory where customer demand exists. There, the power is converted by a transformer to the lower voltages used for distribution to ComEd customers. ComEd's transmission system also provides the principal means for the flow of power required for inter-state transactions and to serve ComEd's wholesale customers.

At present the transmission system in the area of Naperville and Aurora consists of four major 345/138 kV Transmission Switching Stations (Electric Junction, Lombard, Lisle, and Goodings Grove) and two generation plants, Midwest Generation's Will County and Joliet stations, that connect to ComEd's 138 kV system. There are multiple 138/34 kV and 138/12 kV substations that serve local load in this area. These include

Frontenac, Oswego, North Aurora, Warrenville, City of Naperville, Montgomery, and Plainfield. From these stations power is distributed over lower voltage circuits to local neighborhoods.

Q. What factors must be considered in operating and maintaining an adequate, efficient, and reliable transmission system?

A. A transmission system must have capacity sufficient to meet projected power flows while maintaining required voltage levels and system stability, in both normal and contingency conditions.

Q. Why do you study contingency conditions as well as normal operating conditions?

A. Generating units and major transmission system components cannot be assumed to be in operation 100% of the time. In addition to scheduled maintenance requirements, unscheduled outages can occur. Therefore, a level of reliability must be maintained appropriate to the number of customers at risk to possible system failures, balanced by providing service at a reasonable cost. For example, the transmission system must, at a minimum, continue to operate adequately with any single line or transformer in an area out of service. In addition, where the behavior of the transmission system in an area is heavily dependant on the output of a particular generating unit or units, it is necessary to consider the ability of the system to continue to operate when that generating unit is unavailable.

Q. Are there any other factors, which should be considered in evaluating alternative plans, once the need for transmission system reinforcement is demonstrated?

A. Yes. Effects on other portions of the existing transmission system must be considered. A plan must also be capable of being constructed and operated within the time required to meet the need. For example, required real estate must be available. The plan should avoid excessive equipment damage or widespread service outages in case events more severe than planned occur. A suitably robust plan should also consider longer-range requirements for system operation and future growth. And, of course, cost is an important factor.

Q. Does ComEd regularly assess the adequacy and reliability of its transmission system?

A. Yes. ComEd constantly collects data on power flows and voltage levels on all major components of its transmission system. In addition, ComEd forecasts the loads to be experienced in the future (whether caused by retail load growth or wholesale transactions) over a time horizon that varies in length depending upon the portion of the system being studied. This data is used to perform a variety of studies like those that I outline above to determine if, and when, changes are required to the transmission system.

Q. What actions are taken based on these studies?

A. When the data shows that a change is required, ComEd employees, both in the planning and design engineering areas, initially identify potentially feasible means of meeting the needs that are consistent with sound engineering and system planning practices. Depending on the nature of the need, there may be several such alternative plans. Consistent with ComEd's obligations to provide reliable service to its customers, we then determine which of the alternatives are technically feasible and cost-effective. Where there is more than one such option, ComEd assesses the advantages and disadvantages of the various alternatives and selects as the proposed plan the option that would provide adequate, efficient and reliable service to customers at the lowest cost.

Q. What is the time horizon over which alternative transmission plans are studied?

A. Transmission plans are developed by considering a variety of future periods. The ultimate future utilization of each transmission right-of-way is planned at the time of acquisition. These ultimate long-term plans are not driven just by specific load forecasts and generation scenarios over any particular period, but by the need to provide for efficiently coordinated and reliable use of substation sites and transmission rights-of-way.

Much shorter planning horizons are used when making commitments for transmission system development steps because of the number of factors that can significantly impact such plans. Unlike distribution system facilities, the need for which is primarily driven by localized demand forecasts, transmission facility loadings are also influenced by energy resource developments and transmission facility developments, both internal and external to the service territory, as well as by power transfers conducted across the interconnected transmission system. For these reasons, detailed transmission studies are usually limited to a five to ten-year future period, depending on facility lead times, and budget commitments are generally limited to a three- to five-year horizon. Longer term projections of probable transmission needs can be made based on shorter term detailed system studies, but with less certainty.

Q. Why is TSS 143 Wolfs necessary to continue to provide adequate, efficient, and reliable service to customers in the area?

A. The Naperville-Aurora area is undergoing tremendous growth. We have seen increases in electricity demand at more than double the system average rate for the last few years.

This area includes the southwest DuPage, northwest Will, southeast Kane and northeast Kendall Counties. Absent reinforcement to the 138 kV system, ComEd's system in the area could experience overloads in the near future.

Q. How did you determine that the substation is needed?

A. We studied the load on the major components of the present system serving the area. Our forecasts show that, under certain conditions, overloads could occur as soon as the summer of 2003.

Q. Under what conditions would an overload of the system occur?

A. There are a number of single contingency outages during periods of heavy loading that cause existing elements to exceed their emergency ratings. These single contingency outages include any one of the four 345-138 kV autotransformers at the Electric Junction substation, as well as several of the 138 kV lines south of Electric Junction.

Q. Please describe the Wolfs project.

A. A one-line diagram of the project is Attachment TEW-1 to my testimony. The key elements of the project are a 345 kV bus, a 345/138 kV autotransformer of the same type as at Electric Junction, and a 138 kV bus that will connect with six 138 kV lines that serve the southwest suburban area. This substation will be located at the intersection of 138 kV line 0907, connecting Midwest Generation's 138 kV Joliet generating station; 138 kV line 1804, connecting Midwest Generation's Will County generating station to Frontenac TDC, ESS W-602 (a connection to Naperville Electric), and Montgomery TSS; 138 kV line 11102, connecting Electric Junction to Montgomery; and 345 kV lines 1221 and 1223, which connect Dresden generating station to Electric Junction. The proposed substation site can accommodate three additional 345/138 kV autotransformers to support future load growth in the area.

Q. How will the installation of the Wolfs substation avoid the overloads you described?

A. The new autotransformer will offload the autotransformers at TSS 111 Electric Junction, which will eliminate projected overloads at that station. This substation will connect to the 138 kV transmission lines near the center of the high density load area. This will eliminate projected overloads on these lines from TSS 111 Electric Junction going south and from Midwest Generation's 138 kV Joliet generating station going north.

Q. What is ComEd doing to avoid overloads for 2003?

A. While ComEd had originally hoped to have the Wolfs substation in service by the summer of 2003, it has taken steps to mitigate potential overloads in 2003 if that is not the case. These steps include the development of an operating procedure to potentially close a circuit breaker at Electric Junction, depending on the generation on-line in the area. Additionally, ComEd has taken steps to allow it access to some additional generation available in an emergency that will help to off-load the autotransformers at TSS 111 Electric Junction for next summer.

Q. Can these same steps be used to avoid overloads in 2004 and subsequent years?

A. No, additional generation can only defer the need for system reinforcement until 2006 at best. And, as discussed below, this would not be least cost.

Q. Did you consider other projects that might avoid the need to build the substation at Wolfs Crossing?

A. Yes.

Q. Please describe the system alternatives that ComEd examined.

A. We considered replacing the four 345-138 kV autotransformers at Electric Junction with four transformers with nameplate ratings of 500 MVA. In addition to replacing the transformers, this option would entail a substantial rebuild of the 138 kV bus work due to the higher continuous current that would result. This alternative would also require building additional 138 kV lines from Electric Junction south to Naperville. We found that it would not be least cost. Moreover, this alternative would only defer the need for the Wolfs substation.

Q. Please explain why that is.

A. Even with the additional transmission line reinforcement work included with this alternative, eventually the 138 kV lines going south from TSS 111 Electric Junction and north from the Joliet and Will County generating plants will not be able to support additional load growth in the area. Also, the larger transformers at TSS 111 Electric Junction again become loaded beyond their capacity as the area continues to grow.

Q. Are there are other problems with the Electric Junction expansion alternative?

A. Yes, it is not particularly efficient. First, it would not be possible to fully utilize the entire capacity of the larger transformers due to line and right-of-way capacity limitations. Additional 138 kV transmission lines would need to be built. Second, this would be the only ComEd location with 500 MVA transformers. In order to have a spare transformer – which would really be needed with so much load depending on them – ComEd would need to purchase a fifth 500 MVA transformer to keep as a spare. Also, because Electric Junction would become a one-of-a-kind, non-standard installation, there would be additional concerns with operating, training and maintenance. Finally, Wolfs would be more efficient for serving the Naperville-Aurora area because it would result in lower line losses than a source of 138 kV supply farther away.

Q. Would the Electric Junction alternative be the most reliable?

A. No, it would not provide as high a level of reliability as our Wolfs TSS proposal. Electric Junction is already a critical substation for serving the DuPage/Kane/Kendall/Will county area. This alternative would significantly increase the dependence of the area on this single substation. This would make the area more vulnerable to significant service disruptions for multiple contingency events that could cause an outage in all or portions of the substation. Furthermore, there would be a substantial operating risk during the time of the station re-build, due to the outages of equipment and lines while construction was under way. Diversifying the supply to the 138 kV system from the 345 kV system, as we propose to do at Wolfs TSS, will increase the overall reliability of the area.

Q. Did ComEd consider expanding any other substations?

A. Yes, we canvassed the area for other existing substations we could expand. However the Electric Junction substation is the only transmission substation close enough to offer significant relief for this area. More distant substations would be less effective, and therefore defer the need for Wolfs TSS even less.

Q. What other alternative did you consider?

A. ComEd also considered the possibility of purchasing independent generation at or near Electric Junction.

Q. Explain how ComEd would use this alternative to avoid overloads.

A. If we contracted for generation from specific generating units at an independent power producer, it could serve to off-load transformers at Electric Junction by effectively providing an injection of power to the secondary side of the transformer, thus reducing the amount of power required to flow through the transformer.

Q. Why didn't ComEd select this alternative?

A. This alternative was not least cost. The amount of generation in the vicinity of Electric Junction is such that even contracting for all of the beneficial generation only defers the need for Wolfs for a few years. This alternative would also require building additional 138 kV lines from Electric Junction south to Naperville. Moreover, the cost of the capacity required would be expensive to reserve, but likely would go largely unused. As a long-range alternative, ComEd would have to assume the risk that an independent company would stay in the Illinois market. And, the reliability of relying on generation north of Electric Junction, which continues to depend on flow through Electric Junction itself, would not match that of a separate Wolfs TSS.

Q. Did you analyze the cost of the proposed project and the alternatives you considered?

A. Yes. We compared the three alternatives on a net present value basis. Below is a summary of the cost analysis. The analysis uses factors of 3% escalation and a cost of capital of 7.8%. It should be noted that each of the alternative projects eventually requires the installation of Wolfs, only deferring the project to a later date.

Alternative	Project NPV (2002) $M
Proposed Project – Install Wolfs TSS 143 by 6/01/04	28.7
Alternative 1 – Replace existing autotransformers with 500 MVA autotransformers at TSS 111 Electric Junction	35.9
Alternative 2 – Contract for Capacity from an IPP	38.4

Q. Does this complete your direct testimony?

A. Yes.